PATENT
Attorney Docket No. 209391/B&S

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

LEIDNER et al.

Application No. 09/828,219

Filed: April 9, 2001

Group Art Unit: 1714

Examiner: Callie E. Shosho

For: ERASABLE COLORED PENCIL LEAD

DECLARATION UNDER 37 C.F.R. § 1.132 FROM DAVID HACKER

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

I, David Hacker, hereby declare that:

1. I received B.A.Sc. and M.A.Sc. degrees in Chemical Engineering in 1974 and 1975 from the University of Toronto in Toronto, Ontario, Canada.

2. I am employed at Bodycote Materials Testing Canada Inc. in Mississauga, Ontario, Canada as Manager, Polymer Technology, and the areas of my expertise include high solids and waterborne automotive and industrial coatings, polyurethane and epoxy coatings and sealants, polymer synthesis, specification testing of coatings and adhesives, and project management.

3. I am a co-inventor of the above-identified patent application, and am familiar with the application and pending claims.

4. Claims 22, 34-35, 40-41, 73, 85, and 90-91 are rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent 5,595,589 (Hoshiba et al.) and claims 23-33, 36-39, 74-84, and 86-89 are rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Hoshiba et al. The Office Action asserts that Hoshiba et al. discloses a method of using an erasable colored pencil lead composition.

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5. I have reviewed Hoshiba et al. Based upon my review of Hoshiba et al. and the tests conducted under my direction and supervision, it is my opinion that (1) Hoshiba et al. fails to provide a disclosure adequate to enable a person of ordinary skill in the art to make and use an erasable colored pencil lead and (2) the lead disclosed in Hoshiba et al., if prepared following the teaching in Hoshiba et al., does not produce an erasable mark.

6. Hoshiba et al. merely states at column 7, lines 16-22 that "it is also possible to impregnate the residual pores with oil and the like to enhance the lubricity in writing. In order to make the lead erasable as easily as a baked carbon lead with an eraser, the oil has to be selected from oil & fats and/or waxes which are liquids at ordinary temperatures. The concrete examples thereof include silicone oils, mineral oils, liquid paraffins, and α-olefin oligomers." Hoshiba et al. fails to provide any further teaching so as to enable a person of ordinary skill in the art to make an erasable colored pencil lead. Hoshiba et al. sets forth two Examples of making colored pencil leads; however, the Examples do not teach a method of making erasable colored pencil leads. If one attempts to follow the teaching, for example, in Hoshiba et al. Example 1 and the statement at column 7, lines 16-22, the resulting lead is not erasable, as discussed below.

7. Colored pencil leads were prepared substantially as set forth in Example 1 of Hoshiba et al.

The ingredients and their amounts are as follows:

Boron nitride powder (Advanced Ceramics)	50 parts	330.6 g
Polyvinyl chloride (PolyOne)	50 parts	330.6 g
Dioctyl phthalate (BASF)	20 parts	132.2 g
Zinc stearate (Ferro Corp.)	1 part	6.6 g
Total		800.0 g

The ingredients were dry-blended and dispersed in a two-roll mill which was heated with an oil heater to a roll temperature of approximately 178°C and run at a speed of 20 rpm. The resulting two-roll mill compound was extruded on a Brabender extruder at a speed of 40 rpm. The Brabender extruder zone temperatures are given below:

Zone1	Zone 2	Zone 3	Zone 4
180°C	180°C	180°C	169°C.

Initially, a 2.2 mm diameter die was used for the extrusion. The leads produced were very delicate and tended to crumble during immersion in perhydropolysilazane (discussed

below). Therefore, a larger diameter (3.2 mm) die was then used. For the 3.2 mm extrusion, a small portion of the extruded sample from the 2.2 mm extrusion was re-extruded along with some of the two-roll mill compound, as only a limited supply of the two-roll mill compound was available. The diameters of the lead produced are approximately 2.2 mm and 3.2 mm. It is believed that the lead diameter would have little or no effect on the composition of the lead. As the 2.2 mm leads had poorer handling properties than the 3.2 mm leads, attempts were not made to produce leads having even smaller diameters such as the lead in Hoshiba et al. Example 1.

The extruded leads were placed in a ceramic boat and heated in a tube furnace maintained at 180°C for10 hours in air to remove residual plasticizer. The leads were then baked in the furnace according to the following protocol:

Heated from 180°C to 300°C at 12°C/hr under nitrogen
Heated from 300°C to 1000°C at 30°C/hr under nitrogen
Held at 1000°C for one hour
Cooled to room temperature to obtain a first baked lead

Heated from room temperature to 700°C at 60°C/hr in oxygen
Held at 700°C for 5 hours
Cooled to room temperature to obtain a second baked lead

Immersed in perhydropolysilazane (PHPS, from Pred Materials) solution (20% in xylene) for 24 hours
Lead heated from room temperature to 600°C at 60°C/hr and held for 1 hour in nitrogen
Cooled to room temperature

Immersed again in PHPS solution for 24 hours
Lead heated from room temperature to 600°C at 60°C/hr and held for 1 hour in nitrogen
Cooled to room temperature to obtain a third baked lead.

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A copper phthalocyanine pigment solution was prepared by dissolving 16.9 g of C.I. Pigment Blue 15 (Sunfast Blue 15 from Sun Chemical) to 104 g of concentrated sulfuric acid (95%). The mixture of pigment and sulfuric acid was stirred and heated to 40°C for 15 minutes to produce a 14% pigment solution. Hoshiba et al. Example 1 also employs a copper phthalocyanine pigment. The specific pigment designation C.I. Pigment Blue 5:3 employed by Hoshiba et al. is believed to be substantially chemically similar to C.I. Pigment Blue 15.

The third baked lead was immersed in the pigment solution for 24 hours, and then immersed in about 400 mL of deionized water, where the pigment precipitated. The precipitation of the pigment completed within 1 hour. The aqueous solution in contact with the lead was neutralized with a few drops of ammonia solution (checking pH with litmus paper). The neutralized solution was decanted from the beaker, and the leads were rinsed in the beaker under a flow of deionized water for about three minutes. The colored pencil leads thus produced were removed and dried at room temperature for 24 hours.

Samples of the colored pencil lead 3.2 mm were immersed in two grades of silicone oil (50 cSt and 200 cSt, from Dow Corning) for four hours.

The samples are identified as follows:

Sample Number	Description
01-05-8569-83-1	Colored pencil lead 3.2 mm
01-05-8569-83-2	Colored pencil lead 2.2 mm
01-05-8569-83-3	Colored pencil lead 3.2 mm immersed in silicone oil 50 cSt
01-05-8569-83-4	Colored pencil lead 3.2 mm immersed in silicone oil 200 cSt

The colored pencil leads were used to produce marks on photocopy paper (IDEAL™ Dual Purpose Xerographic, 20 lb, 75 g/m^2). To produce a mark, a small piece of the lead was pushed back and forth over the paper with a finger tip using a force estimated to be between 200 g and 400 g. The leads produced strongly colored marks.

The leads obtained from the pigmenting process (01-05-8569-83-1 and 01-05-8569-83-2) and the leads obtained after immersion in silicone oil (01-05-8569-83-3 and 83-4) were

evaluated for erasability. The erasability of the mark was evaluated using a Pink Pearl #101 eraser (Dixon). The mark was rubbed using a fairly strong force estimated to be between 350 g and 500 g. The results are given below. None of the marks erased.

Sample Number	Result
01-05-8569-83-1	Did not erase
01-05-8569-83-2	Did not erase
01-05-8569-83-3	Did not erase
01-05-8569-83-4	Did not erase

8. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: JAN. 17, 2003

David Hacker